Appendix H

AIR QUALITY IMPACT ANALYSIS FOR THE MURPHY RANCH ROAD RESIDENTIAL PROJECT CITY OF MILPITAS

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EXISTING CONDITIONS

Air Pollution Climatology

The amount of a given pollutant in the atmosphere is determined by the amount of pollutant released and the atmosphere's ability to transport and dilute the pollutant. The major determinants of transport and dilution are wind, atmospheric stability, terrain and, for photochemical pollutants, sunshine.

Northwest winds and northerly winds are most common in the project area, reflecting the orientation of the Bay and the San Francisco Peninsula. Winds from these directions carry pollutants released by autos and factories from upwind areas of the Peninsula toward San Jose, particularly during the summer months. Winds are lightest on the average in fall and winter. Every year in fall and winter there are periods of several days when winds are very light and local pollutants can build up.

Pollutants can be diluted by mixing in the atmosphere both vertically and horizontally. Vertical mixing and dilution of pollutants are often suppressed by inversion conditions, when a warm layer of air traps cooler air close to the surface. During the summer, inversions are generally elevated above ground level, but are present over 90 percent of the time in both the morning and afternoon. In winter, surface-based inversions dominate in the morning hours, but frequently dissipate by afternoon.

Topography can restrict horizontal dilution and mixing of pollutants by creating a barrier to air movement. The South Bay has significant terrain features that affect air quality. The Santa Cruz Mountains and Hayward Hills on either side of the South Bay restrict horizontal dilution, and this alignment of the terrain also channels winds from the north to south, carrying pollution from the northern Peninsula toward Milpitas.

The combined effects of moderate ventilation, frequent inversions that restrict vertical dilution and terrain that restrict horizontal dilution give Milpitas a relatively high atmospheric potential for pollution compared to other parts of the San Francisco Bay Air Basin and provide a high potential for transport of pollutants to the east and south.

Ambient Air Quality Standards

Criteria Pollutants

Both the U. S. Environmental Protection Agency and the California Air Resources Board have established ambient air quality standards for common pollutants. These ambient air quality standards are levels of contaminants which represent safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. Table 1 identifies the major criteria pollutants, characteristics, health effects and typical sources. The federal and California

state ambient air quality standards are summarized in Table 2.

The federal and state ambient standards were developed independently with differing purposes and methods, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and particulate matter (PM_{10} and $PM_{2.5}$)

Suspended particulate matter (PM) is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. "Inhalable" PM consists of particles less than 10 microns in diameter, and is defined as "suspended particulate matter" or PM_{10}. Fine particles are less than 2.5 microns in diameter ($PM_{2.5}$). $PM_{2.5}$, by definition, is included in PM_{10}.

In 1997 new national standards for fine Particulate Matter (diameter 2.5 microns or less) were adopted for 24-hour and annual averaging periods. The current PM_{10} standards were to be retained, but the method and form for determining compliance with the standards were revised.

The State of California regularly reviews scientific literature regarding the health effects and exposure to PM and other pollutants. On May 3, 2002, the California Air Resources Board (CARB) staff recommended lowering the level of the annual standard for PM_{10} and establishing a new annual standard for $PM_{2.5}$ (particulate matter 2.5 micrometers in diameter and smaller). The new standards became effective on July 5, 2003.

On April 28, 2005 the California Air Resources Board established a new 8-hour standard for ozone (0.07 PPM), to become effective in 2006.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least forty different toxic air contaminants. The most important, in terms of health risk, are diesel particulate, benzene, formaldehyde, 1,3-butadiene and acetaldehyde.

Public exposure to TACs can result from emissions from normal operations, as well as accidental releases. Health effects of TACs include cancer, birth defects, neurological damage and death.

Table 1: Major Criteria Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
Ozone	A highly reactive photochemical pollutant created by the action of sunshine on ozone precursors (primarily reactive hydrocarbons and oxides of nitrogen. Often called photochemical smog.	! Eye Irritation ! Respiratory function impairment.	The major sources ozone precursors are combustion sources such as factories and automobiles, and evaporation of solvents and fuels.
Carbon Monoxide	Carbon monoxide is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels.	! Impairment of oxygen transport in the bloodstream. ! Aggravation of cardiovascular disease. ! Fatigue, headache, confusion, dizziness. ! Can be fatal in the case of very high concentrations.	Automobile exhaust, combustion of fuels, combustion of wood in woodstoves and fireplaces.
Nitrogen Dioxide	Reddish-brown gas that discolors the air, formed during combustion.	! Increased risk of acute and chronic respiratory disease.	Automobile and diesel truck exhaust, industrial processes, fossil-fueled power plants.
Sulfur Dioxide	Sulfur dioxide is a colorless gas with a pungent, irritating odor.	! Aggravation of chronic obstruction lung disease. ! Increased risk of acute and chronic respiratory disease.	Diesel vehicle exhaust, oil-powered power plants, industrial processes.
Particulate Matter	Solid and liquid particles of dust, soot, aerosols and other matter which are small enough to remain suspended in the air for a long period of time.	! Aggravation of chronic disease and heart/lung disease symptoms.	Combustion, automobiles, field burning, factories and unpaved roads. Also a result of photochemical processes.

Table 2: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-Hour 8-Hour	-- 0.08 PPM	0.09 PPM 0.07 PPM
Carbon Monoxide	8-Hour 1-Hour	9.0 PPM 35.0 PPM	9.0 PPM 20.0 PPM
Nitrogen Dioxide	Annual Average 1-Hour	0.05 PPM --	-- 0.25 PPM
Sulfur Dioxide	Annual Average 24-Hour 1-Hour	0.03 PPM 0.14 PPM --	-- 0.04 PPM 0.25 PPM
PM_{10}	Annual Average 24-Hour	50 $\mu g/m^3$ 150 $\mu g/m^3$	20 $\mu g/m^3$ 50 $\mu g/m^3$
$PM_{2.5}$	Annual 24-Hour	15 $\mu g/m^3$ 65 $\mu g/m^3$	12 $\mu g/m^3$ --
Lead	Calendar Quarter 30 Day Average	1.5 $\mu g/m^3$ --	-- 1.5 $\mu g/m^3$
Sulfates	24 Hour	--	25 $\mu g/m^3$
Hydrogen Sulfide	1-Hour	--	0.03 PPM
Vinyl Chloride	24-Hour	--	0.01 PPM

PPM = Parts per Million
$\mu g/m^3$ = Micrograms per Cubic Meter

Source: California Air Resources Board, Ambient Air Quality Standards (5/17/06)
http://www.arb.ca.gov.aqs/aaqs2.pdf

Ambient Air Quality

The Bay Area Air Quality Management District (BAAQMD) monitors air quality at several locations within the San Francisco Bay Air Basin. The closest multi-pollutant monitoring site to the project site is located in downtown San Jose on Jackson Street. Table 3 summarizes exceedances of State and Federal standards at this monitoring site during the period 2003-2005. Table 3 shows that ozone and PM_{10} exceed the state standards in the South Bay.

Of the three pollutants known to at times exceed the state and federal standards in the project area, two are regional pollutants. Both ozone and particulate matter (PM_{10} and $PM_{2.5}$) are considered regional pollutants in that concentrations are not determined by proximity to individual sources, but show a relative uniformity over a region. Thus, the data shown in Table 3 for ozone and PM_{10} provide a good characterization of levels of these pollutants on the project site.

Carbon monoxide is a local pollutant, i.e., high concentrations are normally only found very near sources. The major source of carbon monoxide, a colorless, odorless, poisonous gas, is automobile traffic. Elevated concentrations, therefore, are usually only found near areas of high traffic volumes.

Attainment Status and Regional Air Quality Plans

The federal Clean Air Act and the California Clean Air Act of 1988 require that the State Air Resources Board, based on air quality monitoring data, designate portions of the state where the federal or state ambient air quality standards are not met as "nonattainment areas". Because of the differences between the national and state standards, the designation of nonattainment areas is different under the federal and state legislation.

The U. S. Environmental Protection Agency has classified the San Francisco Bay Area as a non-attainment area for the federal 8-hour ozone standard. The Bay Area was designated as unclassifiable/attainment for the federal PM_{10} and $PM_{2.5}$ standards.

Under the California Clean Air Act Santa Clara County is a non-attainment area for ozone and particulate matter (PM_{10} and $PM_{2.5}$). The county is either attainment or unclassified for other pollutants.

Sensitive Receptors

The Bay Area Air Quality Management District defines sensitive receptors as facilities where sensitive receptor population groups (children, the elderly, the acutely ill and the chronically ill) are likely to be located. These land uses include residences, schools playgrounds, child care centers, retirement homes, convalescent homes, hospitals and medical clinics. There are no sensitive receptors near the project site. The project itself, however, would be a new sensitive receptor.

Table 3: Summary of Criteria Pollutant Air Quality Data for San Jose Jackson Street and Fremont Chapel Way Sites

Pollutant	Standard	Site	Days Exceeding Standard in:		
			2003	2004	2005
Ozone	Federal 1-Hour	San Jose Fremont	0 0	0 0	0 0
Ozone	State 1-Hour	San Jose Fremont	4 4	0 0	1 1
Ozone	Federal 8-Hour	San Jose Fremont	0 1	0 0	0 0
Carbon Monoxide	State/Federal 8-Hour	San Jose Fremont	0 0	0 0	0 0
Nitrogen Dioxide	State 1-Hour	San Jose Fremont	0 0	0 0	0 0
PM_{10}	Federal 24-Hour	San Jose Fremont	0 0	0 0	0 0
PM_{10}	State 24-Hour	San Jose Fremont	3 0	4 0	1 1
$PM_{2.5}$	Federal 24-Hour	San Jose Fremont	0 0	0 0	0 0

Source: Air Resources Board, Aerometric Data Analysis and Management (ADAM), 2006. (http: //www.arb.ca.gov./adam/cgi-bin/adamtop/d2wstart)

Significance Criteria

The document *BAAQMD CEQA Guidelines*[1] provide the following definitions of a significant air quality impact:

- A project contributing to carbon monoxide (CO) concentrations exceeding the State Ambient Air Quality Standard of 9 parts per million (ppm) averaged over 8 hours or 20 ppm for 1 hour would be considered to have a significant impact.

- A project that generates criteria air pollutant emissions in excess of the BAAQMD annual or daily thresholds would be considered to have a significant air quality impact. The current thresholds are 15 tons/year or 80 pounds/day for Reactive Organic Gases (ROG), Nitrogen Oxides (NO_x) or PM_{10}. Any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact.

- Any project with the potential to frequently expose members of the public to objectionable odors would be deemed to have a significant impact.

- Any project with the potential to expose sensitive receptors or the general public to substantial levels of toxic air contaminants would be deemed to have a significant impact.

Despite the establishment of both federal and state standards for $PM_{2.5}$ (particulate matter, 2.5 microns), the BAAQMD has not developed a threshold of significance for this pollutant. For this analysis, $PM_{2.5}$ impacts would be considered significant if project emissions of PM_{10} exceed 80 pounds per day.

The BAAQMD significance threshold for construction dust impact is based on the appropriateness of construction dust controls. The BAAQMD guidelines provide feasible control measures for construction emission of PM_{10}. If the appropriate construction controls are to be implemented, then air pollutant emissions for construction activities would be considered less-than-significant.

[1] Bay Area Air Quality Management District, BAAQMD CEQA Guidelines, 1996 (Revised December 1999).

IMPACTS

Impact 1: Construction Dust Emissions. Construction activities such as demolition, clearing, excavation and grading operations, construction vehicle traffic and wind blowing over exposed earth would generate fugitive particulate matter emissions that would temporarily affect local air quality. This impact is potentially significant, but normally mitigable.

Construction dust would affect local air quality during implementation of the project. The dry, windy climate of the area during the summer months creates a high potential for dust generation when and if underlying soils are exposed to the atmosphere. The proposed project would substantial excavation and earthmoving. The movement of earth on the site is a construction activity with a high potential for creating air pollutants. After grading of the site, dust would continue to affect local air quality during construction of the project.

According to the *BAAQMD CEQA Guidelines*, emissions of ozone precursors (ROG and NOx) and carbon monoxide related to construction equipment are already included in the emission inventory that is the basis for regional air quality plans, and thus are not expected to impede attainment or maintenance of ozone and carbon monoxide standards in the Bay Area. Thus, the effects of construction activities would be increased dustfall and locally elevated levels of particulate matter (PM_{10} and $PM_{2.5}$) downwind of construction activity. Construction dust has the potential for creating a nuisance at nearby properties. This is considered a potentially significant impact.

- **Mitigation Measure 1:** Consistent with guidance from the BAAQMD, the following measures shall be required of construction contracts and specifications for the project:

- Water all active construction areas at least twice daily and more often during windy periods; active areas adjacent to existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives;

- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard;

- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites;

- Sweep daily (preferably with water sweepers) all paved access roads, parking areas, and staging areas at construction sites; water sweepers shall vacuum up excess water to avoid runoff-related impacts to water quality;

- Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets;

- Apply non-toxic soil stabilizers to inactive construction areas;

- Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.);

- Limit traffic speeds on unpaved roads to 15 mph;

- Install sandbags or other erosion control measures to prevent silt runoff to public roadways;

- Replant vegetation in disturbed areas as quickly as possible.

The following are additional mitigation measures recommended by the BAAQMD to reduce engine exhaust emissions:

- Use alternative fueled construction equipment

- Minimize idling time (5 minutes maximum);

- Maintain properly tuned equipment;

- Limit the hours of operation of heavy equipment and/or the amount of equipment in use.

The above measures include all feasible measures for construction emissions identified by the Bay Area Air Quality Management District for large sites. According to the District threshold of significance for construction impacts, implementation of the measures would reduce construction impacts of the project to a less-than-significant level.

Impact 2: Construction TAC Emissions. During construction various diesel-powered vehicles and equipment would be in use on the site. Exposure of sensitive receptors to diesel particulate would represent a less-than-significant impact.

In 1998 the California Air Resources Board identified particulate matter from diesel-fueled engines as a toxic air contaminant (TAC). CARB has completed a risk management process that identified potential cancer risks for a range of activities using diesel-fueled engines.[2] High volume freeways, stationary diesel engines and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truckstop) were identified as having the highest associated risk.

Health risks from Toxic Air Contaminants are function of both concentration and duration of exposure. Unlike the above types of sources, construction diesel emissions are temporary, affecting an area for a period of weeks at any one location. Additionally, construction related sources are mobile and transient in nature, and the bulk of the emission occurs within the project site at a substantial distance from most nearby receptors. Because of its

[2] California Air Resources Board, Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles, October 2000.

short duration and lack of nearby sensitive receptors, health risks from construction emissions of diesel particulate would be a less-than-significant impact.

Mitigation Measure 2: None required.

Impact 3: Permanent Local Impacts. Project traffic would add to carbon monoxide concentrations near streets and intersections providing access to the site. This is a less than significant impact.

On the local scale, the project would change traffic on the local street network, changing carbon monoxide levels along roadways used by project traffic. Carbon monoxide is an odorless, colorless poisonous gas whose primary source in the Bay Area is automobiles. Concentrations of this gas are highest near intersections of major roads.

Carbon monoxide concentrations under worst-case meteorological conditions have been predicted for signalized intersections affected by project. These intersections were selected as having the worst intersection Level Of Service and highest average delay. Peak hour traffic volumes were applied to a screening form of the CALINE-4 dispersion model to predict maximum 1-and 8-hour concentrations near these intersections. Appendix 1 provides a description of the model and a discussion of the methodology and assumptions used in the analysis. The model results were used to predict the maximum 1- and 8-hour concentrations, corresponding to the 1- and 8-hour averaging times specified in the state and federal ambient air quality standards for carbon monoxide.

Table 4 shows the results of the CALINE-4 analysis for the peak 1-hour and 8-hour traffic periods in parts per million (PPM). The 1-hour values are to be compared to the federal 1-hour standard of 35 PPM and the state standard of 20 PPM. The 8-hour values in Table 4 are to be compared to the state and federal standard of 9 PPM.

Table 4 shows that existing predicted concentrations near the intersections meet the 1-hour and 8-hour standards. Background traffic increases would increase concentrations by up to 1.6 Parts Per Million (PPM). Traffic from the project would further increase concentrations by up to 0.2 Parts Per Million (PPM). However, concentrations with background and project traffic growth would not exceed the ambient air quality standards.

Since project traffic would not cause any new violations of the 8-hour standards for carbon monoxide, nor contribute substantially to an existing or projected violation, project impacts on local carbon monoxide concentrations are considered to be less-than-significant.

Mitigation Measure 3: None required.

Impact 4: Permanent Regional Impacts. Additional trips to and from the project would result in new air pollutant emissions within the air basin. The emissions from these new trips and area sources would not exceed the BAAQMD thresholds of significance for regional pollutants and so would represent a less-than-significant impact.

Table 4: Worst Case Carbon Monoxide Concentrations Near Selected Intersections, in Parts Per Million

Intersection	Existing		Existing + Background		Existing+ Background+ Project+	
	1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour
McCarthy/ Montegue	9.6	6.5	11.2	7.7	11.3	7.7
Abel/ Calaveras	10.8	7.3	11.5	7.8	11.5	7.8
Calaveras/ Milpitas	11.2	7.6	12.1	8.3	12.2	8.3
McCarthy/ Bellew	8.9	6.0	9.9	6.7	10.1	6.9
McCarthy/ Tasman	9.0	6.0	10.3	7.0	10.4	7.1
Alder/ Tasman	9.3	6.3	11.5	7.8	11.6	7.9
Most Stringent Standard	20.0	9.0	20.0	9.0	20.0	9.0

Vehicle trips generated by the project would result in air pollutant emissions affecting the entire San Francisco Bay Air Basin. Regional emissions associated with project vehicle use and residential area sources have been calculated using the URBEMIS2002 emission model. The methodology used in estimating vehicular emissions is described in Attachment 2.

The incremental daily emission increase associated with project land uses is identified in Table 5 for reactive organic gases and oxides of nitrogen (two precursors of ozone) and PM_{10}. The Bay Area Air Quality Management District has established threshold of significance for ozone precursors and PM_{10} of 80 pounds per day. Proposed project emissions shown in Table 5 would not exceed these thresholds of significance, the proposed project would have a less-than-significant effect on regional air quality.

Mitigation Measure 4: None required.

Impact 5: Increased Exposure to TACs. The project would include sensitive receptors that would be exposed to stationary and mobile sources of TACs. This impact would be significant.

The project is located within an industrial area. The current inventory of Toxic Air Contaminant emissions maintained by the Bay Area Air Quality Management District lists one source of TACs within one-fourth mile of the project: KLATencor. This facility abuts the project site to the north. This TAC source is not identified as a priority source requiring preparation of a health risk assessment or notification under the Air Toxics "Hot Spots" Information and Assessment Act.[3]

There are several diesel backup generators in the project vicinity to provide power in the case of a power outage to industrial buildings. More importantly, there are two diesel-powered stormwater pumping stations located at the northwest and southwest corners of the site. The pumping station at the northwest corner of the site utilizes 3 750-horsepower diesel engines to pump collected stormwater into Coyote Creek. The pumping station at the southwest corner of the site utilizes 3 335-horsepower diesel engines. These engines were installed in 1986 and represent relatively "dirty" diesel technology. They are permitted by the Bay Area Air Quality Management District. Because the permits pre-date TAC controls, the facilities have not been subject to a Health Risk Assessment.

In 1998 the California Air Resources Board (CARB) identified particulate matter from diesel-fueled engines as a toxic air contaminant (TAC). To reduce public exposure to

[3] Bay Area Air Quality Management District, Toxic Air Contaminant Control Program Annual Report 2002, June 2004.

diesel particulate, CARB approved in 2000 the *Risk Reduction Plan to Reduce Particulate*

Table 5: Project Regional Emissions in Pounds Per Day

	Reactive Organic Gases	**Nitrogen Oxides**	**PM_{10}**
Project Emissions	58.3	51.6	44.3
BAAQMD Significance Threshold	80.0	80.0	80.0

Matter Emissions from Diesel-Fueled Engines and Vehicles.[4] As part of the plan, CARB adopted an Airborne Toxic Control Measure (ATCM) for stationary diesel engines in February 2004. Private businesses and public agencies operating stationary prime and emergency standby diesel engines in California are required to reduce emissions from these engines down to specified limits by either retrofitting existing engines with control devices or replacing existing engines with new equipment that meets the standards.

Should the City of Milpitas decide to replace the existing engines rather than retrofit them, this would trigger BAAQMD New Source Review rules that require that a Health Risk Assessment be prepared. The Health Risk Assessment would quantify cancer and non-cancer risks at the closest residence, which is currently well over a mile from the facility.

The approval of the project would place a residential building within 120 feet of the pump plant exhaust at the northwest corner of the project site and within 150 feet of the pump plant exhaust at the southwest corner of the project site. Because of the size of the diesel engines at the facility northwest of the project, their proximity to residences and their upwind location under prevailing northwest wind, it highly probable that the pump facilities would have unacceptably high health risks that would preclude issuance of a permit.[5]

Since the project has the potential to expose sensitive receptors to substantial levels of toxic air contaminants it would be deemed to have a significant impact. The project would have a secondary impact in that approval of the project would probably preclude the installation of new diesel pumps at the two adjacent stormwater pumping plants, requiring that alternative technology be utilized.

Mitigation Measure 5: The project layout could be revised to increase the minimum distance between sources of diesel exhaust and residential buildings. At the north end of the project the parking structure, currently at the center of the proposed apartment complex, could be relocated to provide a buffer zone between the pumping plant and the nearest residential structure. Air handling systems could be designed to filter intake air to reduce exposure to residences. At the southern end of the project proposed parklands could be redesigned to provide a buffer zone between the pumping plant and residential structures. While these types of measures can reduce the exposure of project residents to toxic air contaminants, it is not likely to reduce exposures to levels that are less-than-significant, so this impact would remain significant after mitigation.

Alternatively, the applicant could negotiate with the City of Milpitas to pay the additional costs for replacing the pump engines with cleaner engines that otherwise would not be required by state law. It me possible to install new diesel engines with particulate traps and Selective Catalytic Reduction (SCR) or non-diesel engines (natural gas or electrical) that could reduce risks to below the significance threshold. The diesel option would require

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[4] California Air Resources Board, Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles, October 2000.

[5] Randy Frazier, Senior Engineer, Bay Area Air Quality Management District, personal communication May 18, 2006.

modeling studies demonstrating that the health risks are below the thresholds of significance.

If non-diesel engines are utilized or diesel engines can be found that are clean enough to meet the health risk significance thresholds, this impact could be reduced to a level that is less-than-significant.

Impact 6: Increased Exposure to odors. The project would include sensitive receptors that would be located downwind from potential odor sources. This impact would be less-than-significant.

The project would place new residences generally downwind of existing odor sources. The San Jose/Santa Clara Water Pollution Control Plant and Zanker Road Landfill are known sources of odor located generally upwind of the project site. *BAAQMD CEQA Guidelines* establishes project screening trigger levels for potential odor impacts. These are minimum distances that need to be provided between new sensitive receptors and various odor sources to avoid the potential for adverse odor impact. When these minimum distances are not met, the potential for odor impact exists.

The BAAQMD minimum distances for a wastewater treatment plan, sanitary landfill or composting facility is 1 mile. The project is more than 1 mile from the nearest portion of both the San Jose/Santa Clara Water Pollution Control Plant and Zanker Landfill, so odor impacts of the project would be less-than-significant.

Impact 7: Cumulative Regional Impacts. The project would require a General Plan Amendment that would result in an increase in daily trips/ vehicle miles traveled and therefore would also have a cumulatively significant regional air quality impact.

According the *BAAQMD CEQA Guidelines*, a project that generates criteria air pollutant emissions in excess of the BAAQMD annual or daily thresholds would have a significant air quality impact individually and cumulatively. Proposed project emissions shown in Table 5 would not exceed the BAAQMD thresholds.

The BAAQMD CEQA Guidelines do provide, however, that projects with individually insignificant impacts could have a cumulatively significant impact.[6] If a project requires a General Plan amendment it would have a significant cumulative impact if the project generates more Vehicle Miles Traveled than that anticipated under the previous land use designation. The proposed project does require a General Plan amendment, and the trip generation and Vehicle Miles Traveled under the proposed designation is substantially higher than under the existing designation. Therefore, the project would have a significant cumulative air quality impact on regional air quality.

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[6] Bay Area Air Quality Management District, BAAQMD CEQA Guidelines, April 1996 (Revised December 1999)

The project has been found to have a cumulative air quality impact because it involves a re-zoning where the new designation would result in greater Vehicle Miles Traveled than the existing zoning. The cumulative impact is related to inconsistency with the regional air quality plan which is based upon current general plan zoning. The inconsistency with the regional plan would be temporary, in that the regional air quality plans are regularly updated using the latest ABAG projections on population and employment. The inconsistency with the regional air quality plan would only exist until the next update of the air quality plans, when the proposed rezoning would be reflected in the ABAG projections.

Mitigation Measure 7: The *BAAQMD CEQA Guidelines* recommended mitigation measures for cumulative impacts are the same as those for project impacts. The following mitigation strategies should be utilized:

$ Provide a satellite tele-commute center within or near the development.

$ Provide secure and conveniently placed bicycle parking and storage facilities.

- Allow only natural gas fireplaces in residences
- Require outside power receptacles that would allow use of electric lawn and garden equipment for landscaping.
- Construct transit amenities such as bus turnouts/bus bulbs, benches, shelters, etc.
- Provide direct, safe, attractive pedestrian access from project land uses to transit stops and adjacent development.
- Utilize reflective (or high albedo) and emissive roofs and light colored construction materials to increase the reflectivity of roads, driveways, and other paved surfaces, and include shade trees near buildings to directly shield them from the sun's rays and reduce local air temperature and cooling energy demand.
- Provide physical improvements, such as sidewalk improvements, landscaping and bicycle parking that would act as incentives for pedestrian and bicycle modes of travel.

The above mitigation program would be expected to reduce emissions by 5-10%. Since trip generation under the proposed zoning is more than double that under the existing zoning, the project cumulative air quality impact would be significant and unavoidable.

ATTACHMENT 1: CALINE-4 MODELING

The CALINE-4 model is a fourth-generation line source air quality model that is based on the Gaussian diffusion equation and employs a mixing zone concept to characterize pollutant dispersion over the roadway. Given source strength, meteorology, site geometry and site characteristics, the model predicts pollutant concentrations for receptors located within 150 meters of the roadway. The CALINE-4 model allows roadways to be broken into multiple links that can vary in traffic volume, emission rates, height, width, etc.

A screening-level form of the CALINE-4 program was used to predict concentrations.[7] Normalized concentrations for each roadway size (2 lanes, 4 lanes, etc.) are adjusted for the two-way traffic volume and emission factor. Calculations were made for a receptor at a corner of the intersection, located 25 feet from the curb. Emission factors were derived from the California Air Resources Board EMFAC2002 computer program based on a 2006 Bay Area vehicle mix.

The screening form of the CALINE-4 model calculates the local contribution of nearby roads to the total concentration. The other contribution is the background level attributed to more distant traffic. The 1-hour background level in 2006 was taken as 5.6 PPM and the 8-hour background concentration was taken as 3.7 PPM. These backgrounds were estimated using isopleth maps and correction factors developed by the Bay Area Air Quality Management District.

Eight-hour concentrations were obtained from the 1-hour output of the CALINE-4 model using a persistence factor of 0.7.

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[7] Bay Area Air Quality Management District, BAAQMD CEQA Guidelines, 1999.

ATTACHMENT 2: NEW VEHICLE TRAVEL EMISSIONS

Estimates of regional emissions generated by project traffic were made using a program called URBEMIS-2002.[8] URBEMIS-2002 is a program that estimates the emissions that result from various land use development projects. Land use projects can include residential uses such as single-family dwelling units, apartments and condominiums, and nonresidential uses such as shopping centers, office buildings, and industrial parks. URBEMIS-2002 contains default values for much of the information needed to calculate emissions. However, project-specific, user-supplied information can also be used when it is available.

Inputs to the URBEMIS-2002 program include trip generation rates, vehicle mix, average trip length by trip type and average speed. Trip generation rates for project land uses were provided by the project transportation consultant. Average trip lengths and vehicle mixes for the Bay Area were used. Average speed for all types of trips was assumed to be 30 MPH.

The URBEMIS-2002 run assumed summertime conditions with an ambient temperature of 85 degrees F.

The analysis was carried out assuming a 2007 vehicle mix. The URBEMIS-2002 output is attached.

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[8] Jones and Stokes Associates, Software User's Guide: URBEMIS2002 for Windows with Enhanced Construction Module, Version 8.7, April 2003.

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\murphy.urb
Project Name: Murphy Ranch
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	11.23	4.98	3.68	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	47.07	46.62	491.49	0.29	44.29

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	58.31	51.60	495.17	0.29	44.30

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\murphy.urb
Project Name: Murphy Ranch
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.38	4.97	2.11	0	0.01
Hearth - No summer emissions					
Landscaping	0.25	0.01	1.56	0.00	0.01
Consumer Prdcts	0.00	-	-	-	-
Architectural Coatings	10.60	-	-	-	-
TOTALS(lbs/day,unmitigated)	11.23	4.98	3.68	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Apartments low rise	23.97	23.12	243.79	0.15	21.97
Condo/townhouse general	23.11	23.49	247.70	0.15	22.32
TOTAL EMISSIONS (lbs/day)	47.07	46.62	491.49	0.29	44.29

Includes correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2007 Temperature (F): 85 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Apartments low rise	23.38	6.00 trips/dwelling unit	374.00	2,244.00
Condo/townhouse general	17.81	8.00 trips/dwelling unit	285.00	2,280.00
		Sum of Total Trips		4,524.00
		Total Vehicle Miles Traveled		29,064.47

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	55.20	1.80	97.80	0.40
Light Truck < 3,750 lbs	15.10	3.30	94.00	2.70
Light Truck 3,751- 5,750	16.10	1.90	96.90	1.20
Med Truck 5,751- 8,500	7.10	1.40	95.80	2.80
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.40	0.00	50.00	50.00
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.10	0.00	0.00	100.00
Motorcycle	1.70	82.40	17.60	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.20	8.30	83.30	8.40

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.8	4.6	6.1	11.8	5.0	5.0
Rural Trip Length (miles)	15.0	10.0	10.0	15.0	10.0	10.0
Trip Speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	27.3	21.2	51.5			

Changes made to the default values for Land Use Trip Percentages

The Trip Rate and/or Acreage values for Apartments low rise
have changed from the defaults 6.9/23.38 to 6.0/23.38
The Trip Rate and/or Acreage values for Condominium/townhouse general
have changed from the defaults 6.9/17.81 to 8.0/17.81

Changes made to the default values for Area

The consumer products option switch changed from on to off.

Changes made to the default values for Operations

The operational emission year changed from 2005 to 2007.